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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES  
**DIVISION OF ENVIRONMENTAL PROTECTION**

333 W. Nye Lane, Room 138  
Carson City, Nevada 89706

August 9, 2004

**NOTICE OF DECISION**

**WATER POLLUTION CONTROL PERMIT  
NUMBER NEV88040**

**Glamis Marigold Mining Company  
Marigold Mine - Millennium Expansion Project**

The Nevada Division of Environmental Protection has decided to approve a major modification to Water Pollution Control Permit NEV88040, held by Glamis Marigold Mining Company, to incorporate the Millennium Expansion Project. This permit authorizes the construction, operation, and closure of approved mining facilities in Humboldt County. The Division has been provided with sufficient information, in accordance with Nevada Administrative Code (NAC) 445A.350 through NAC 445A.447, to assure the Division that the groundwater quality will not be degraded by this operation, and that public safety and health will be protected.

The modified permit will become effective August 24, 2004. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to Nevada Revised Statute (NRS) 445A.605 and NAC 445A.407. All requests for appeals must be filed by 5:00 PM, August 19, 2004, on Form 3, with the State Environmental Commission, 333 West Nye Lane, Capitol Complex, Carson City, Nevada 89706-0851. For more information, contact Rob Kuczynski directly at (775) 687-9441, toll free in Nevada at (800) 992-0900, extension 4670, or visit the Division website at: <http://ndep.nv.gov/bmrr/bmrr01.htm>.

Two comment letters were received during the public comment period. The first letter, dated July 13, 2004, was received from Linda Bullen, Attorney for Lionel Sawyer and Collins, representing Western Exploration, Inc. and Doby-George LLC. The second letter, dated July 23, 2004 was received from Christie Whiteside, Program Associate for Great Basin Mine Watch. Division responses to the received comments are attached to this Notice of Decision.

**NDEP Response to Lionel Sawyer and Collins/Western Exploration Inc.-Doby George LLC (WEDG) Comments Letter dated July 13, 2004 and received via surface mail on July 16, 2004**

**Special Note:** The NDEP reviewed and considered all comments provided by WEDG and their attorney in the above-referenced letter. However, it is noted that a majority of the comments provided in the letter were restatements of comments received in prior correspondence from WEDG dated April 6, 2004, and which were already responded to as part of the Division's June 3, 2004 letter to WEDG (both letters are on file and available for public review at the BMMR). For brevity, the NDEP responses which follow, in *italics*, have been limited to those comments extracted from the more recent WEDG letter that specifically relate to the Marigold Mine-Millennium Expansion major modification to Water Pollution Control Permit NEV88040.

**WEDG Comment #1:** "Proximity of Proposed Waste Rock Storage Areas to WEDG Properties and Trout Creek" ... "no amount of preventative measures ... will adequately protect the environment. Only relocation of the waste rock dumps will prevent the contamination of WEDG and public lands and public waters."

**NDEP RESPONSE:** *As stated in the Division's June 3, 2004 letter to WEDG, the Marigold Mine is permitted as a "Zero Discharge Facility". NDEP-BMRR requires the containment of all process fluids to prevent the degradation of the waters of the State. The existing and proposed process components at the Marigold facility have been designed and constructed to operate without any discharge except for meteorological events that exceed the design storm event. The waste rock storage areas have been designed and located to drain away from Trout Creek and WEDG's property. Additionally, as part of the Millennium Expansion, GMMC will incorporate into the mine design, a ten to twenty foot high protective berm along the west toe of the West Waste Rock Storage Area. The purpose of this berm is to redirect any potential surface runoff from the storage area away from nearby receptors including Trout Creek and WEDG's private property. The berm would also function to contain drainage water in the unlikely event there is any flow from the toe of the waste rock facility. As such, reasonable preventative measures have been incorporated in the approved mine design and continued environmental monitoring and compliance inspections are intended to ensure that the Waste Rock Storage Areas do not contaminate Trout Creek or WEDG property.*

WEDG Comments #2&#3: “Characterization of the Waste Rock ‘Relatively Benign’ Is Improper and Is of No Legal Significance” ... “Moreover, because the leachate from the waste rock demonstrably exceeds several state and federal water quality standards, it is clearly not *utterly* benign, and the fact that it is merely less deleterious than it might be is no reason to permit it to contaminate the environment by the current placement of the waste rock dumps.” ... “Testing of GMMC’s Waste Rock Was Inadequate”

NDEP RESPONSE: *The Division acknowledges that the leachate data presented in the Draft SEIS (and WPCP application) does indicate some exceedances of the Profile I standards. However, it is important to understand the significance of this data. Differences may exist among the various analytical methods, constituents leached over the short and long term, and the acid neutralization capacity/capability of the waste rock. When evaluating mine waste rock for potential to release pollutants and acid generation potential, the Division relies principally on the Meteoric Water Mobility Procedure (MWMP), Static, and Kinetic Test procedures. As discussed in the June 3, 2004 letter to WEDG, Acid Generation/Acid Neutralization data for 112 samples sites located in the proposed Millennium Expansion Project Area (i.e. Terry Zone, Target #1, Target #2, Antler and Basalt Pits) were included in the Millennium Expansion Project application. In addition, tests results were also provided by GMMC for twenty waste rock composite samples analyzed using the MWMP and Kinetic (Long-Term Column Leach). Lastly, NDEP-BMRR also reviewed the core drilling data (i.e. whole rock analyses) collected and submitted by WEDG at a May 13, 2004 meeting.*

*The MWMP (ASTM Method E2242-02) is a qualitative, not quantitative, laboratory leach test which provides an indication only as to what constituents could be solubilized. The MWMP tests conducted on waste rock from the existing and the proposed pits indicated that meteoric leachate from the waste rock could be elevated in arsenic and aluminum relative to Nevada Profile I water standards. However, as a qualitative test, the MWMP results cannot be used to determine actual concentrations of constituents in any potential discharge solution from a constructed waste rock facility.*

*The Static Tests are preliminary predictive tests that permit the determination of a waste rock’s potential to generate net acidity (i.e. Acid Generating Potential or AGP) by analyses for the various forms of sulfur and neutralizing minerals (i.e. Neutralization Potential or NP). However, the static tests do not determine the release of acidity as a function of factors such as mineralogy and time, and similar to the MWMP cannot therefore be used to quantitatively predict water quality. The Static Test results indicate a negligible potential for acid generation; Waste rock characterization samples collected and analyzed throughout the Marigold Mine and over the life of the mine have consistently indicated that the waste rock appears to be non-acid generating.*

*The Kinetic Tests are used to confirm the results of the Static Tests and explicitly determine any rate of acid generation and neutralization. Depending on the particular test employed, waste rock samples are leached over a period of hours, days, weeks, months or years under laboratory or field conditions. To more representatively*

*determine the concentration of constituents in a potential discharge solution, long-term Kinetic Tests (i.e. column leach tests) were utilized. These results demonstrated that over the long-term (i.e. 20 weeks), leaching was at a much lower level and that the leachate solution did not exceed the Profile I standards. In conclusion, GMMC has followed standard and required procedures in performing the geochemical characterization of its mined materials.*

**WEDG COMMENT #4:** “The Proposed Cover Is Inadequate to Protect WEDG Property”... “Specifically, six (6) inches of cover on the waste rock dumps is not sufficient to prevent contaminated runoff from the waste rock dumps from adversely impacting the Trout Creek drainage and WEDG’s private lands.”

**NDEP RESPONSE:** *In preparation of the proposed Millennium Expansion, GMMC and HydroEngineering performed geochemical analyses on mined material and modeled the hydrology of the covered waste storage areas in an effort to better determine what drainage which could potentially exit the waste rock storage areas. As communicated in the Division’s June 3, 2004 letter to WEDG, the hydrologic modeling predicted that many years of substantially above-normal precipitation would be required to raise the moisture content of the rock to the point where it would be physically possible for any water to drain from the bottom of the storage area. Additionally, the store and release ET cover modeling indicated there would be very low percolation of meteoric water below the active evaporative zone within the profile of the waste rock storage areas. Because of the low net infiltration, the potential to mobilize constituents out of the waste rock storage areas is projected to be insignificant. Therefore, even if the waste rock has constituents with potential for mobilization, the climatic conditions (i.e., amount of precipitation and net evaporation), plus the store and release ET cover would not permit sufficient infiltration of the waste rock storage area to mobilize the constituents to the receiving environment (i.e., the groundwater, surface water and alluvium beneath the waste rock storage area).*

*Furthermore, the Division is not aware of any drainage, past or present, from the toe of any of the existing waste rock storage areas at the Marigold Mine; and yet as noted above, the mine design includes an additional measure for a protective berm to capture and redirect any flow if it were to occur.*

*Lastly, the Marigold Sulfide Rock Management Plan provides specific design plans for the placement and cover of PAG (potentially acid generating) material and to encapsulate the PAG rock and preclude any meteoric contact. It should be noted that the submitted tentative permanent closure plan does not provide an actual depth of cover for the waste rock facilities, and while the EIS and Reclamation Plan considered a minimum waste rock cover/growth media depth of 6 inches, an actual final permanent closure plan has not yet been submitted for the West and North Waste Rock Storage Areas, nor*

*approved by BMRR's Closure Branch. Typically, such covers must be a minimum of 12 inches.*

WEDG COMMENT #5: "The 'Pollute First-clean up Later' Approach Will Result in Avoidable Contamination of the Environment and Is Not in the Best Interest of the Public" ... "Relocation of the waste rock dumps to an area within the 29 square miles of land at GMMC's disposal...and into an area not subject to seasonal high water flow and not adjacent nor upgradient to WEDG lands could both be easily accomplished and would completely prevent the contamination of WEDG lands from occurring in the first place."

NDEP RESPONSE: *As communicated to WEDG during several prior meetings, it is not the purview of the NDEP-BMRR to stipulate where a company must locate a given mine facility or component. Rather, the Division's focus is to ensure that mine facilities comply with the design and operating standards and do not degrade waters of the State. As noted in the prior responses, preventive design measures are being implemented and the ongoing monitoring program will be utilized to prevent potential contamination of ground or surface waters.*

WEDG COMMENT #6: "WEDG Disagrees With Several of NDEP's Fundamental Suppositions"

NDEP RESPONSE: *The NDEP-BMRR appreciates the concern and interest expressed by WEDG regarding the permitting of Marigold's Millennium Expansion Project. The Division met with representatives of WEDG on multiple occasions prior to, and during our review of the submitted permit application. The Division reviewed and considered all information submitted by WEDG, and subsequently provided the written response determination dated June 3, 2004. The Division is open to reviewing and evaluating any additional data or documentation WEDG can submit in support of specific arguments or claims, but until such time without the benefit of any new data or information, we can only reaffirm our prior determination.*

WEDG COMMENT #7: "GMMC Has at its Disposal Enormous Acreage Within Which to Relocate the Waste Rock Dumps" ... "Placement of the dumps in an alternate location within the 29-square miles in GMMC's control and *not* immediately upgradient to WEDG lands and Trout Creek drainage would protect the interests of WEDG as well as serve the public interest by protection of public land and water to the greatest extent possible."

NDEP RESPONSE: *Please see responses to Comments #1 & #5.*

WEDG COMMENT #8: “WEDG Continues to Object to the Section 30 Placement of the Heap Leach Facilities as Authorized in the ROD” ... “WEDG has not restated its specific comments opposing the Sec. 30 heap leach facilities herein because it appears, based upon GMMC’s application to NDEP for the permit modification application, that GMMC contemplates locating the heap leach facilities in Sec. 16, to which WEDG does not object.”

NDEP RESPONSE: *Comment noted. The submitted permit application did not include plans for a heap leach facility at Section 30.*

**NDEP Response to Great Basin Mine Watch (GBMW) Comments Letter dated July 23, 2004 and received via e-mail on July 25, 2004 and surface mail on July 26, 2004**

GBMW COMMENT #1: “The tailings impoundment is now in closure, and it is our hope that any future seepage from the facility will be curtailed; however, there is still the concern that as groundwater pumping at the Lone Tree Mine ceases, that various contaminants will be mobilized from the soils as the water table recovers. Most of the monitoring wells included in the monitoring regime for this permit are dry, leaving very little in the way of data to determine whether or not degradation of waters of the state continues. Additionally, there was some question as to whether or not the arsenic exceedances in wells around the tailings impoundment were the result of the drying of the wells, or due to the leakage...The NDEP should at the very least require Glamis to drill a borehole deep enough to reach the water table in the vicinity of the wells with the highest arsenic levels to determine the extent of contamination. Monitoring of the unsaturated zone should also be conducted on an ongoing basis and added to the permit.”

NDEP RESPONSE: *While not relevant to the proposed operations for the Millennium Expansion Project, prior leakage from the now closed tailings impoundment was identified in observation wells located north of the dam. Respective remedial actions were undertaken, including both physical modifications to the impoundment and development of a more extensive network of monitoring wells. The network of monitoring wells, both within the tailings impoundment and downgradient of it, are monitored on a semiannual basis for TDS, WAD cyanide, chloride, barium, and nitrate. Several of these wells are also monitored quarterly for arsenic, TDS, WAD cyanide, chloride, barium, and nitrate. Annually, a Profile I analysis is performed on solution collected from the wells. It should be noted that the current monitoring regime does include downgradient wells that intercept both a perched aquifer and the deeper, underlying groundwater.*

GBMW COMMENT #2: “One other major concern regarding this proposal and the draft permit is that none of the new cells or additions to the heap leach pad will contain leak detection. Leakage from Cell 7, which is apparently the only portion of the heap leach pad equipped with leak detection, currently exceeds permit limitations as shown by the 4<sup>th</sup> quarter 2003 monitoring reports. The NDEP states that since all future leach pad

expansions will meet the minimum design criteria pursuant to 445A.434, that no leak detection will be required. The fact sheet also goes on to state that because of the NDEP's concern regarding the local soil and clay material, that Glamis has agreed to increase the number of tests to demonstrate that the permeability criteria will be met. This is not enough. The 10-6 cm/sec permeability criteria amounts to almost two meters per year of migration of contaminants. In light of NDEP's concerns, the leakage from Cell 7, and the fact that there is limited monitoring downgradient from the heap, because of dry monitoring wells, all future leach pad extensions should be equipped with leak detection. Additionally, monitoring should be increased through the addition of monitoring wells and increased sampling of all hydrological layers to detect any groundwater degradation."

*NDEP RESPONSE: As noted, in an effort to fully satisfy the heap leach pad minimum design and construction criteria pursuant to NAC 445A.434, Glamis agreed to increase the frequency of the soil/clay permeability tests. Properly constructed leach pads with appropriate construction QA/QC and in conformance with the existing design requirements, have proven to provide acceptable performance. In regards to groundwater monitoring, it should be noted that several new monitoring wells were either added or relocated as follows:*

- *New Monitoring Well LDMP 13 was installed to monitor the ground water below Cell 7. The angled well runs from the edge of the heap leach pad to the lowest elevation point on top of bedrock near the boundary between Cell 5 and Cell 6. The well was drilled at a 43-degree angle from vertical and bore depth of approximately 513 feet. LDMP 13 installation was completed during the first quarter of 2004 and has since been shown to be dry.*
- *New Monitoring Well LDMP 12 will be located northeast of Cell 7, directly downgradient of the proposed Section 17 Leach Pad (Cell 12). Actual location and depth will be determined at the time of drilling which will occur in conjunction with the Cell 12 expansion.*
- *Monitoring Well LDMP 6 will be replaced by a new well to be designated as LDMP 6a to accommodate the Millennium heap leach expansion plan. This new well will be downgradient of Cell 7, located about 200 feet east of LDMP 6 and drilled to a depth of approximately 140 feet. LDMP 6a will be located as close as possible to the proposed Cell 12, with the actual location and depth to be determined at the time of drilling in conjunction with the Cell 12 expansion.*